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The MDX interface is a client/server TCP/IP based communications interface that supports encoding and decoding through a series of user-configurable encoder and decoder modules.

The JTAV system is divided into two primary functions: the Oracle database query and translation processing accomplished on the JTAV server (the Defense Transportation Tracking System (DTTS) machine) and the message processing and track injection accomplished on the UB client machine. A typical JTAV configuration is represented in Figure 1-1.



JTAV functions primarily as a system of requests and responses between a JTAV capable MDX interface on a UB client and an MDX Lite/JTAVInfoSvr encoding process running on the JTAV server. All of the database information being collected by the JTAVInfoSvr script on the JTAV server is contained in an Oracle database. The JTAV process works as follows:

The MDX interface on the UB client queries across the net, establishing a connection with the MDX Lite interface on the JTAV server. On the JTAV server, MDX Lite requests information from the JTAVInfoSvr process. JTAVInfoSvr then goes to the Oracle database and retrieves the requested information and sends it to MDX Lite as raw data. MDX Lite receives the raw data, translates it into a JTAV binary structure, encodes it, and sends it to the MDX channel on the UB client. Once the encoded JTAV binary data is received on the UB client, the MDX channel decodes the information, translates it to a JUNIT track structure, and automatically injects it into the TDBM on the UB client, which displays the track and subsequent updates on the geodisplay. After the initial database is encoded and sent to the UB client, additional processes (JTAVReadDBPipe and JTAVReadDBUpdt) retrieve any updates to the Oracle database and send them through MDX Lite.

1.2 Installation

The JTAV system requires that a JTAV/GCCS Interface Client 1.0.0.1 tape be loaded on the UB client and a JTAV/GCCS Interface Server 1.0.0.0 tape be loaded on the JTAV server. Install the JTAV tapes on the JTAV server and UB client in accordance with Section 2 and Section 3, respectively, of this manual.

1.3 Startup

Once the JTAV tapes have been loaded onto the respective machines, you must perform configuration procedures to establish an MDX interface on the UB client machine and set up the scripts necessary to execute the startup scripts on the JTAV server machine.

Configure an MDX interface on the UB client in accordance with Section 3 of this manual.

Section 2

JTAV Server Installation and Configuration

JTAV operates based on the connectivity between a JTAV server machine (an Oracle database on a Defense Transportation Tracking System (DTTS) machine) and a Unified Build (UB) client machine. Accomplishing this connectivity requires a JTAV capable MDX channel on the UB client and an Oracle database query protocol/JTAV encoding software on the JTAV server. These capabilities must be loaded as tapes onto the respective machines and properly configured before JTAV processing can begin.

Install and configure the JTAV/GCCS Interface Server 1.0.0.0 tape on the JTAV server in accordance with the following steps.

2.1 JTAV/GCCS Interface Server 1.0.0.0 Tape Installation

1. Log in on the JTAV server and launch a shell. A shell prompt will appear.
2. Insert the JTAV/GCCS Interface Server 1.0.0.0 tape into a tape drive available to the JTAV server. Wait until the tape drive indicates it is ready (i.e., the light stops flashing) before you proceed.
3. At the shell prompt, change directories until you are in the directory where the JTAV/GCCS Interface Server 1.0.0.0 software will be placed. (Your System Administrator/Database Administrator (SA/DBA) should provide the directory for the software placement.)
4. Using the verbose format (i.e., tar xv), extract the tar file from the JTAV/GCCS Interface Server 1.0.0.0 tape onto the JTAV server's hard drive. The complete software is now installed.

2.2 JTAV/GCCS Interface Server 1.0.0.0 Tape Configuration

Configure the JTAV/GCCS Interface Server 1.0.0.0 tape in accordance with the following steps.

1. In a shell on the JTAV server, invoke a UNIX editor (EMACS, vi, etc.) and modify and save the JTAV_GCCS/progs/.JTAV_HOME file so that the actual absolute path name of the JTAV_GCCS directory is in the file. This file exists to serve as a pointer which defines the absolute path of the JTAV_GCCS home directory for the JTAVStart process and must be modified to reflect the JTAV_GCCS directory location before JTAVStart can be successfully run on the JTAV server.

Example: If the JTAV_GCCS directory is located in the /h/segments/third_party/ directory, the information in the .JTAV_HOME file should read: /h/segments/third_party/JTAV_GCCS.

2. Change the directory to JTAV_GCCS/Scripts/.

3. In a shell, run the following sql scripts. These sql scripts modify the existing Oracle database scripts to provide various functions required by JTAV.

Note: User must be properly configured as an Oracle user to perform the following functions. A properly configured Oracle user must have the following Oracle permissions:

- Connect
- Resource
- Select on DTTS_SUMMARY
- Alter on DTTS_SUMMARY
- Execute on SYS.DBMS
- Create any trigger
- Create synonym DTTS_SUMMARY for [path].DTTS_SUMMARY

In addition to these Oracle permissions, the ORACLE_HOME and ORACLE_SID environment variables must also be properly set.

Note: When performing the following steps, single “[x] does not exist” error messages may appear. User should ignore these windows. (If multiple error messages appear, they should be reported to the DBA.)

- a. At the shell prompt, enter sqlplus and press [Return].
- b. At the <login name> and <password> prompts, enter a valid Oracle user name and password (see your SA/DBA for a valid login).

Note: Performing some of these steps may take you out of sqlplus. If this happens, repeat Steps a and b to restart sqlplus.

- c. Enter @DTTS_SUM_UPDT.sql and press [Return]. This script provides for a summary updates table to be created as record updates arrive with a definitive Unique Row ID (URID) sequence.
 - d. Enter @sequence_DTTS_SUM_UPDT.sql and press [Return]. This script provides a feature to assign a definitive Unique Row ID (URID) sequence to arriving record updates.
 - e. Enter @trigger_DTTS_SUM.sql and press [Return]. This script provides a trigger to automatically send any database updates to the JTAVReadDBUpdt process.
 - f. Enter @read_PIPE.sql and press [Return]. This script provides an interface between the raw Oracle output from the trigger and the JTAVInfoSvr process.
 - g. Enter exit and press [Return] to exit sqlplus and return to the shell prompt.
4. At the shell prompt, use a UNIX editor to modify and save the JTAVInfoSvr.ini, JTAVReadDBUpdt.ini, and JTAVReadDBPipe.ini files in the JTAV_GCCS/data/ directory to reflect the Oracle user name and password (obtained from the SA/DBA).

5. Using a UNIX editor, modify and save the JTAVMDXLITE.cfg file in the JTAV_GCCS/data/ directory. This file is made up of numerous fields, each separated by a colon. Modify the fields as follows:
 - a. Edit field 2 to reflect the JTAV server machine's hostname. (For example, if the JTAV server machine's hostname is horatio, then field 2 should say horatio.)
 - b. Edit field 3 to match the recognized name of the UB client machine. (For example, if the UB machine is designated as yorick.disa.mil, then field 3 should say yorick.disa.mil.) This field will also match the hostname which appears in the MACHINE field in the EDIT MDX window on the UB machine.
 - c. Edit/verify the port number in field 14. Field 14 is the transmit port for the MDX Lite process on the JTAV server. Field 14 defaults to 2911. This field must match the RECV PORT field in the EDIT MDX window for the JTAVMDX channel on the UB client.
 - d. Edit/verify the port number in field 15. Field 15 is the receive port for the MDX Lite process on the JTAV server. Field 15 defaults to 2910. This field must match the XMIT PORT field in the EDIT MDX window for the JTAVMDX channel on the UB client.

<p>WARNING: DO NOT ADD OR DELETE COLONS IN THIS CONFIGURATION FILE. Any fields not mentioned above do not have any changes.</p>
--

6. Change to the JTAV_GCCS/SegDescrip directory and enter PostInstall to set up various permissions.

The JTAV/GCCS Interface Server 1.0.0.0 software is now configured. Once the JTAV/GCCS Interface Client 1.0.0.1 tape is installed and properly configured on the UB client machine, JTAV processing can begin. (See Section 4, "JTAV Startup and Shutdown.")

Section 3

UB Client Installation and Configuration

JTAV operates based on the connectivity between a JTAV server machine (an Oracle database on a Defense Transportation Tracking System (DTTS) machine) and a Unified Build (UB) client machine. Accomplishing this connectivity requires a JTAV capable MDX channel on the UB client and an Oracle database query protocol/JTAV encoding script on the JTAV server. These capabilities must be loaded as tapes onto the respective machines and properly configured before JTAV processing can begin.

The MDX interface provides point-to-point data communications -- specifically, transmitting track information from one designated site to another. In JTAV, the JTAV/GCCS Interface Client 1.0.0.1 software adds JTAV capabilities to the existing MDX interface, enabling a JTAV MDX channel to query the JTAV server machine and decode MDX Lite encoded JTAV tracks.

Install and configure the JTAV/GCCS Interface Client 1.0.0.1 tape on the UB client in accordance with the following steps.

3.1 JTAV/GCCS Interface Client 1.0.0.1 Tape Installation

1. If the tape has not been previously inserted into the DAT drive, insert the JTAV/GCCS Interface Client 1.0.0.1 tape into a tape drive that is available to the UB client machine.
2. On the designated JTAV UB client machine, log in as sysadmin and select SEGMENT INSTALLER from the SOFTWARE menu. The SEGMENT INSTALLER window appears. (See the Unified Build System Administrator's Guide for more details on using the SEGMENT INSTALLER window.)

If loading from a local device (i.e., local DAT drive at device 0), proceed directly to step 7. If loading from a remote or non-standard device, complete steps 3 through 6 before proceeding to step 7.

3. In the upper portion of the SOURCE box in the SEGMENT INSTALLER window, click SELECT MEDIA. The SELECT MEDIA window appears.
4. In the DEVICE box, select the media type of the segment tape (i.e., DAT or EXABYTE). (To manually enter the filename of the device, select OTHER and then enter the device name in the field that appears.

CAUTION: It is highly recommended that only no-rewind devices be used.

5. In the HOST box, select the location of the tape.

6. If the segment tape is loaded on the local workstation, select **LOCAL**, then proceed to step 7. If the segment tape is loaded on a remote machine, see the instructions below.
 - a. Select **REMOTE**. A **NAME** field appears.
 - b. Click the button next to the **NAME** field to display a list of hosts available on the network.
 - c. From the list of available hosts, select the name of the remote host where the tape is loaded.
 - d. Click **OK** to return to the **SEGMENT INSTALLER** window.
7. Click **READ TOC**. The **TABLE OF CONTENTS** box displays a list of each software segment contained on the tape.
8. From the list in the **TABLE OF CONTENTS** box, select the **JTAV/GCCS Interface Client 1.0.0.1** tape, then click **INSTALL**.
9. When the segment installation is complete, a warning window appears stating **Selected Segment(s) Installed Successfully**.
10. Click the **EXIT** button to dismiss this warning window.
11. On the **SEGMENT INSTALLER** window, click **EXIT** to dismiss the window.
12. Using the **Logout** option under the **Hardware** menu, log out of the system.

3.2 JTAV MDX Interface Creation and Configuration

To use the JTAV MDX interface, you must first create an MDX channel and then configure it to process the encoded JTAV track information.

3.2.1 JTAV MDX Creation

Create a JTAV MDX channel as follows:

1. On the designated JTAV UB client machine, log in as a user.
2. From the **Comms** menu, select **Communications**. The **COMMUNICATIONS** window appears.

The **COMMUNICATIONS** window contains an entry for each channel in the database.
3. In the **COMMUNICATIONS** window, click **ADD**. The **ADD CHANNEL** window appears.
4. In the **NAME** field, enter a name for the channel. Name is restricted to alphanumeric, underline (), and hyphen (-) characters.
5. In the **XREF** field, enter the unique three-character communications cross-reference code for the channel.

6. Verify that the INTERNAL checkbox is selected.
7. In the DISPLAY SETTINGS box, verify that ALL is selected.
8. In the INTERFACE list, select MDX. (If applicable, the MDX interface automatically determines the selection in the INITIAL SETTINGS list.)
9. To create the MDX channel, click OK. The COMMUNICATIONS window appears, displaying an entry for the MDX channel.

3.2.2 JTAV MDX Channel Configuration

Note: Configure this channel only if your machine is the UB client machine and not simply a workstation receiving JTAV data via a broadcast.

The UB client machine is going to be the client and will decode. The JTAV server machine is going to be the server and the MDX Lite interface will encode.

Before configuring and starting the MDX channel for a server/client connection, the System Administrator must confirm the following:

1. Check the `/etc/services` file to ensure that the proposed transmit and receive port designations do not conflict with existing TCP port numbers.
2. Set up the route between the server and client at each site, ensuring that there is connectivity between server and client.
3. Establish the exact site host names. Each host table must contain an entry for the other site. (See the Unified Build System Administration Guide for more information.)

Configure the MDX window as follows (refer to the Unified Build User's Guide for further details):

1. From the list of channels in the COMMUNICATIONS window, select the MDX channel and then click EDIT. The EDIT MDX window appears. Data for the selected channel appears in the fields. Note that the NAME, XREF, and INTERFACE are view-only fields and cannot be edited.

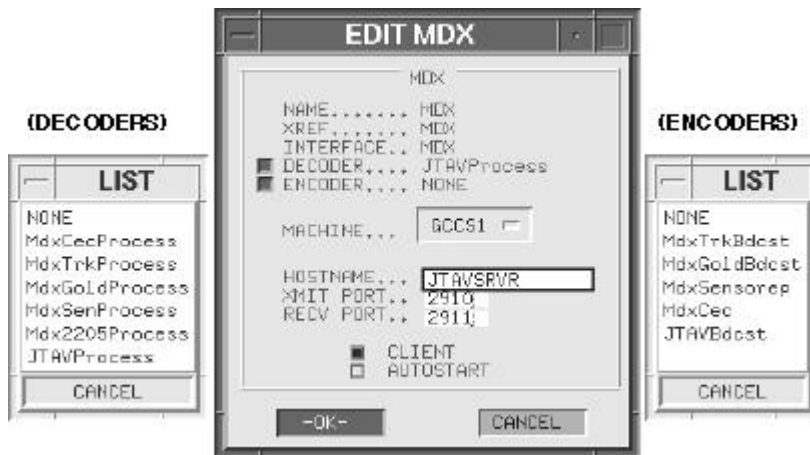


Figure 3-1 EDIT MDX Window

- Click the DECODER and ENCODER list boxes in front of the fields to view available encoder and decoder choices and select a value.

DECODER value: JTAVProcess is the only valid selection for JTAV processing.

ENCODER value: NONE is the valid selection for JTAV processing.

Note: While there is a DECODER value called JTAVBdest, it is NOT a valid selection for JTAV processing at this time.

- Click the right trackball button on the name in the MACHINE list field (for example, GCCS1) to show a list of available choices. This field should contain the local host's name.
- In the HOSTNAME field, enter the host name of the JTAV server.
- Enter the correct transmit port number in the XMIT PORT field.
- Enter the correct receive port number in the RECV PORT field.
- Click the checkbox beside the CLIENT field to toggle it ON and indicate that this is a client machine.
- Click the checkbox beside the AUTOSTART field to toggle it ON or OFF, depending whether your machine requires AUTOSTART functions or not.
- Click OK to accept the changes or click CANCEL to discard them.

WARNING: Never set a value in both ENCODER and DECODER fields in an MDX channel, as “loop back” occurs and excessive CPU usage takes place.

CAUTION: If the MDX channel is activated (i.e., its current STATUS in the COMMUNICATIONS window

is ON), making edits in the EDIT MDX window and then clicking OK will automatically de-activate the channel and restart it with the edited settings. This action can cause messages that are enroute to be lost.

The EDIT MDX window contains the following fields:

NAME

Unique channel name. This field cannot be edited.

XREF

Unique three-character communications cross-reference code for the channel. This field cannot be edited.

INTERFACE

Communications interface for the channel. This field cannot be edited.

DECODER/ENCODER

Selection of a decoder or encoder depends upon the type of data to be received by the MDX interface.

DECODER -- *Valid entries include:*

- None
- MdxCecProcess (Use if receiving CEC data)
- MdxTrkProcess (Use if receiving JMCIS track data)
- Mdx2122 Process (Use if receiving Link-11 data only from 2.1.2.2 system)
- Mdx2205 Process (Use if receiving Link-11 data only from 2.2.0.5 system)
- MdxGoldProcess (Use if receiving OTH-Gold messages)
- MdxSenProcess (Use if receiving SENSOREP messages)
- JTAVProcess (Use for all JTAV processing)

ENCODER -- *Valid entries include:*

- None
- MdxTrkBdcst (Use if transmitting JMCIS track data)
- MdxGoldBdcst (Use if transmitting OTH-Gold messages)
- MdxSensorep (Use if transmitting SENSOREP messages)
- MdxCEC (Use if transmitting CEC data)
- JTAVBdcst (Used by JTAV server only.)

MACHINE

Name of the local machine being used to transmit or receive messages on this channel.

HOSTNAME

Name of the remote system.

XMIT/RECV PORT

Service numbers for the transmitting and receiving ports. Values at the sending and receiving sites must be “mirror images” of each other.

Default values for the MDX interface are 2910 and 2911.

Note: The System Administrator must check the `/etc/services` file to ensure that the transmit and receive port assignments do not conflict with existing TCP/IP port numbers.

CLIENT

ON - designates this machine as a client in a server/client configuration.

AUTOSTART

Automatically turn on the channel at UB startup.

Section 4

JTAV Startup and Shutdown

Once the JTAV/GCCS Interface Server 1.0.0.0 tape has been installed on the JTAV server and the JTAV/GCCS Interface Client 1.0.0.1 tape has been installed on the UB client, JTAV processing can begin.

The following list provides the sequence of startup and shutdown procedures for JTAV processing. Each procedure is listed beside the section in which it is described.

- 4.1 Start the MDX channel on the UB client.
- 4.2 Start the script on the JTAV server.
- 4.3 Stop the script on the JTAV server.
- 4.4 Stop the MDX channel on the UB client.

4.1 Startup of JTAV MDX on UB Client

In the COMMUNICATIONS window, click the right trackball button and select START from the pop-up menu. The channel STATUS will switch from OFF to ON and the JTAV MDX channel will begin JTAV processing.

4.2 Startup of JTAV on JTAV Server

Note: Ensure JTAV is not running by entering JTAVStop in a shell. JTAVStop can be run repeatedly while the interface is down without detriment to the system.

In a shell on the JTAV server, enter JTAVStart and press [Return]. The JTAVInfoSvr process will start, launching the JTAVREADDBUpdt and JTAVReadDBPipe processes. In addition, JTAV processing on the JTAV server will start.

4.3 Shutdown of JTAV on JTAV Server

In a shell on the JTAV server, enter JTAVStop and press [Return]. The JTAVInfoSvr process will shut down the JTAVREADDBUpdt and JTAVReadDBPipe processes as well as itself. In addition, all JTAV processing on the JTAV server will stop.

4.4 Shutdown of JTAV MDX on UB Client

In the COMMUNICATIONS window, click the right trackball button and select STOP from the pop-up menu. The channel STATUS will switch from ON to OFF and the JTAV MDX channel will begin JTAV processing.

Section 5

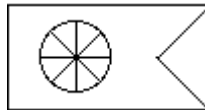
JTAV Operation

5.1 JTAV Track Display

Once information has been translated across from the Oracle database to the MDX on the UB machine, it is decoded and automatically injected into the TDBM. The TDBM displays the message information as a track on the geodisplay.

JTAV tracks are manipulated just like a standard JUNIT track in UB. For more information on JUNIT tracks, see the Unified Build User's Guide.

JTAV track symbol is displayed as follows on the geodisplay:



5.2 JTAV View Window

The JTAV View window appears when you select a JTAV track from the geodisplay and either double-click or select EDIT or VIEW from the right trackball pop-up menu. (Note: The JTAV View window may also appear when you select VIEW, EDIT or DELETE while performing a DATABASE SEARCH from the TRACKS pull-down menu located on the main system menu.)

EDIT: OTH REAL-WORLD UNIT U00002

TRACK NUMBERS		RTN	COMMAND
LTN ..	U00002	JTAVID	###123#456
FTN		
STN		
UID ..	J86217270440		

ATTRIBUTES		LAST REPORT	
MISSION ID..	MISSIONID	TIMELATE	000:01
TRANSPONDER.	###123#456	RPT DTG	191702Z NOV 96
DEPARTURE...	LOCAL	POSITION	100000S 130000W
DEP. TIME...	221100Z MAY 96	CSE/SPDTKT
DESTINATION.	OTHER	SENSOR	GPS
ETA.....	292200Z MAY 96	SOURCE	JTAV

ADDITIONAL INFORMATION	
COMMAND	REMARK
JTAVINFO	A POSITION REPORT WAS RECEIVED AT 191702Z NOV 96
JTAVINFO	NUM VEH: 0151 NUM PAX: 0400
JTAVINFO	COMMENTS
JTAVINFO	END OF DRIVER COMMENTS

NEXT PREV OI EXIT

Figure 5-1 JTAV View Window

The JTAV View window is a view-only window and cannot be edited. The JTAV Edit window contains a TRACK NUMBERS box, a RECEIVED TRACK NUMBER scroll list, an ATTRIBUTES box, a LAST REPORT box (titled INITIAL REPORT when creating a new track), and an ADDITIONAL INFORMATION box.

TRACK NUMBERS Box

LTN

Local track number. Every track is given a unique number by the system for track identification.

FTN

Force Over-the-Horizon Track Coordinator number.

STN

System track number.

UID

Unique identifier. Begins with three letters representing the site that reported the track, followed by a series of numbers to identify the track.

RECEIVED TRACK NUMBER (RTN) Scroll List

RTN's are used for track correlation. Each received track number in the list consists of JTAVID and the reporting command. All characters within the following quotes are legal characters that may appear in the reporting command, MISSION ID, and TRANSPONDER ID fields:

“0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ*#%:.,”. All illegal characters are turned into the pound (#) sign by the system.

ATTRIBUTES Box

MISSION ID

Mission identification number.

TRANSPONDER

A DTTS-assigned identification number which identifies the transponder on a vehicle.

DEPARTURE

Departure location.

DEP. TIME

Departure time.

DESTINATION

Expected arrival location.

ETA

Estimated time of arrival.

LAST REPORT Box

TIMELATE

Amount of elapsed time (in hours and minutes) since the latest report.

RPT DTG

Date-time group for the last reported position.

POSITION

Latitude and longitude of the last reported position.

CSE/SPD

Course for the track (in degrees true), followed by the speed of the track (in knots).

SENSOR

Global Position System (GPS) is a system which uses a satellite to pick up the track at its last reported position.

SOURCE

JTAV is the station source code. Letters are taken from the Source XREF Table, which can be viewed from the SOURCE XREF TABLE option.

XREF

Two-character source cross-reference code for the Command that originated the track report.

ADDITIONAL INFORMATION Box

This box provides four lines of information about the mission, all having a COMMAND field that contains a hardcoded command of "JTAVINFO." The first line is a status indicator, showing what the last macro type received was for that unit and when it was received. The second line contains information regarding the number of vehicles (NUM VEH) and the number of personnel (NUM PAX) being transported on a mission. The third and fourth lines contain drivers comments.

JTAV View Window Pop-up Menu Options

In addition to the options available on the buttons in the JTAV View window, the following pop-up menu options are available:

XMIT

Transmits data for the selected track out to other locations. (For more information on the XMIT option, see the *TRACKS* Section of the *Unified Build User's Guide*.)

DELETE

Deletes selected track(s) from the system. When a track is deleted, its track symbol and label are removed from the tactical display and its data is removed from the track database. (For more information on the DELETE option, see the *TRACKS* Section of the *Unified Build User's Guide*.)

NEXT

(Button available if multiple tracks were selected for deletion.) Displays the next track in the scroll list without deleting the track whose data is currently displayed in the window.

PREV

(Button available if multiple tracks were selected for deletion.) Displays the previous track in the scroll list without deleting the track whose data is currently displayed in the window.

HISTORY

Invokes the Track History window, allowing you to view the track's movement, enter new reports, and edit existing reports. (For more information on track history, see the *TRACKS* Section of the *Unified Build User's Guide*.)

CENTER

Centers the CHART geodisplay on the selected track.

APPLY

Applies any changes and dismisses the window. (This option functions the same as the OK button.)

EXIT

Exits the JTAV View window. (This option functions the same as the EXIT button.)